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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,194

05/12/2006

Moo-Seok Lee

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BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER

MENON, KRISHNAN S

ART UNIT

PAPER NUMBER

1797

NOTIFICATION DATE

DELIVERY MODE

07/29/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,194	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> Krishnan S. Menon	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

Claims 1-11 are pending as amended in the RCE of 7/9/09.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/593,480. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims of the reference application recites all the limitations of the instant claims

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

Claim interpretation:

Claim 1 is for a submerged hollow fiber membrane module. The module has two filtrate collection headers, on one each end of the hollow fibers, and the fiber ends are potted to the header. The headers are spaced apart by support tubes, at least one of the support tubes has air diffusion holes. Support tubes also have air diffusion tubes having air diffusion holes.

**1. Claims 1-6 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of (1) Henshaw, et al, (US 5,783,083); (2) Ohkubo et al (US 4,876,006)**

Modules having hollow fibers with potting headers on both ends to collect filtrate are well known. Providing air diffusion tubes with air holes in the tubes is also well known. Air diffusion tubes are positioned with respect to the hollow fibers such that the air bubbles flow between the hollow fibers and agitate the water and way the hollow fibers to keep the fibers clean from surface deposits of dirt or solids. Applicant's claimed invention appears to be the physical positioning of the air diffusion tubes and also the air diffusion tubes acting as supports for the headers. This is not found patentable over the cited references.

**(1) Henshaw, et al, (US 5,783,083):** Henshaw teaches hollow fiber bundles potted with headers on both ends (see fig. 7 below), with an air diffusion tube (45) supportively separating the headers and having air diffusion pipes (41) branching off

from it located withing the bundle and between the hollow fibers as claimed in claim 1.

The only element missing here is the plural support tubes, and support tube itself having separate air holes. However, as can be seen in fig 9 below, the reference teaches plural such bundles interlinked with plural air tubes as support and air diffusers.

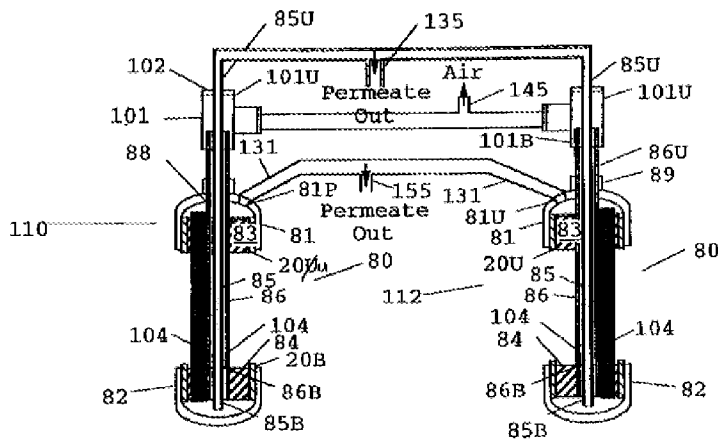


Fig. 9

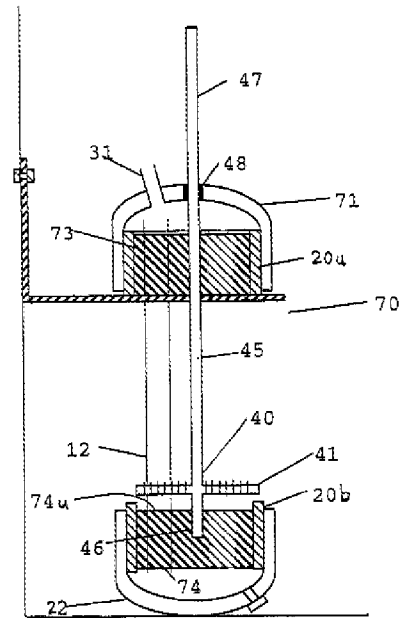


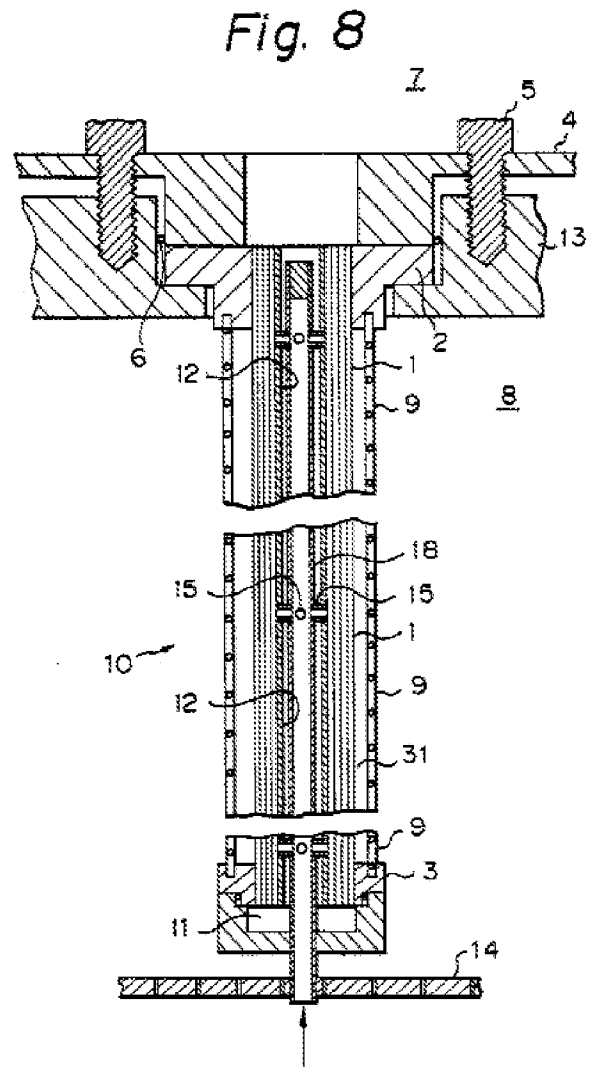
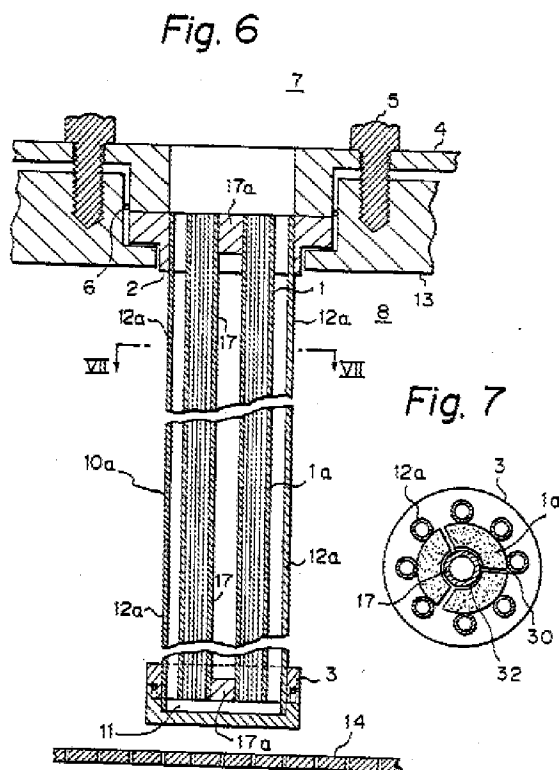
Fig. 7

The missing elements are obvious to one of ordinary skill in the art from the teaching of this reference itself – there is nothing patentable in having plural pipes 45 with pipes 41 in larger sized modules as in Fig 7. Also, the Ohkubo reference below teaches providing plural air tubes/support tubes – one of ordinary skill in the art would combine the teachings of these references to arrive at the applicant’s invention for the reasons taught by Ohkubo, such as for larger modules.

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**(2) Ohkubo et al (US 4,876,006):** Ohkubo teaches hollow fiber modules having potted headers at both ends and connected by support tubes having air diffusion tubes as claimed in claim 1 - see the figures copied below, as well as the excerpts from column 5. It is clear from the teaching that there can be plural support tubes with plural air holes, the plural air holes having extended tube nozzles (see 15 in fig 8). The cited paragraph also provide3s different combinations of the design which make the claimed invention obvious. Also, it would be obvious to combine the teaching of this reference with that of Henshaw to have the horizontal air distribution pipes (41) of Henshaw in the teaching of Ohkubo to have more air distribution.

When the dimension of the bundles 1a is large, it is preferable to provide an air pipe or plural air pipes 18 provided with plural air injection nozzles 15 outside the conduit 12 as schematically shown in FIG. 8, the pipe or pipes 18 being plugged at the top and open at the 25 bottom thereof. With the provision of the air injection nozzles 15 extending into the air pipe 18, air bubbles injected through the nozzles promote the removal of cakes particles from the fibers. It is further preferable to dispose nozzles 15 adjacent the upper and lower bundle 30 plates 2 and 3 so that the sedimentary deposit of particles on these plates may be removed by the air injected from the nozzles 15. Alternately, the conduit 12 may be disposed inside the air pipe 18. In the case of the modified module such as that shown in FIGS. 6 and 7, the 35 reinforcing pipe 17 may be modified as an air pipe similar to the pipe 18.



Regarding the dependent claims, sizing the air holes, and air pipes are not patentable limitations because one of ordinary skill in this art would be capable of designing such details for the desired filtration load. Air holes having varying diameters is also within the capability of one of ordinary skill to design to obtain proper air distribution. The cited references teach series arrangement of modules.

1. **Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henshaw and/or Ohkubo as applied to claim 1 above, and further in view of Hayano et al (US 4,061,821 or Brun et al (US 3,984,328).**

Claims differ from the teaching of Henshaw or Ohkubo in having braided hollow fibers with increased tensile strength. However, hollow fibers with braid reinforcement is well known as seen in Hayano or Brun, and would be obvious to one of ordinary skill to use these teachings to have stronger hollow fibers. Regarding the tensile strength of the fiber of .1 Kg, or 10 Kg, the braid supported fibers of these references inherently have such capability, unless applicant can show otherwise.

### ***Response to Arguments***

Arguments moot; new grounds for rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/  
Primary Examiner, Art Unit 1797